

- 1 What is claimed:
- 2 1. Amphipathic polymer particles prepared by polymerizing a plurality of
- 3 components comprising:
- 4 an unsaturated monomer containing a hydrophobic moiety, and
- 5 an unsaturated monomer containing a convertible moiety that is hydrophobic in
- 6 an acidic environment and hydrophilic in a basic environment.
- 7 2. The amphipathic polymer particles of claim 1, wherein the content of polymeric
- 8 units derived from the unsaturated monomer containing a convertible moiety is in the
- 9 range of 1% to 60% by weight.
- 10 3. The amphipathic polymer particles of claim 1, further comprising a polymerizable
- 11 dye monomer.
- 12 4. The amphipathic polymer particles of claim 1, further comprising a cross linker.
- 13 5. The amphipathic polymer particles of claim 1, wherein the content of polymeric
- 14 units derived from the unsaturated monomer containing the hydrophobic moiety is in the
- 15 range of 30% to 99% by weight, and the content of polymeric units derived from the
- 16 unsaturated monomer containing the convertible moiety is in the range of 1% to 60% by
- 17 weight.
- 18 6. A method of preparing amphipathic polymer particles comprising the steps of:
- 19 admixing an aqueous carrier, an unsaturated monomer containing a hydrophobic
- 20 moiety, an unsaturated monomer containing a convertible moiety, and a surfactant to
- 21 form an emulsion;
- 22 initiating a polymerization by adding a catalyst to the emulsion,
- 23 continuing polymerization at a temperature and for a period of time sufficient to
- 24 form amphipathic polymer particles,
- 25 wherein the amphipathic polymer particles have a size range of 50–500 nm.
- 26 7. The method of claim 6, further comprising the step of filtering the reaction
- 27 mixture through a filter.
- 28 8. The method of claim 6, wherein the emulsion further contains a polymerizable
- 29 dye monomer.
- 30 9. The method of claim 6, wherein the emulsion further contains a cross linker.
- 31 10. The amphipathic polymer particles produced by the method of claim 6.
- 32 11. An ink composition comprising:
- 33 a vehicle,
- 34 a surfactant,

1 a pigment, and
2 amphipathic polymer particles prepared by the method of claim 6,
3 wherein said vehicle is water or a mixture of water and one or more humectants.

4 12. An ink composition comprising:
5 a vehicle,
6 a surfactant, and
7 amphipathic polymer particles prepared by the method of claim 8,
8 wherein said vehicle is water or a mixture of water and one or more humectants.

9 13. Amphipathic polymer particles prepared by polymerizing a plurality of
10 components comprising:
11 an unsaturated monomer containing a hydrophilic moiety, polymerized through an
12 ATRP process, and
13 an unsaturated monomer containing a hydrophobic moiety, polymerized in an
14 emulsion,
15 wherein the amphipathic polymer particles have a size range of 50-500 nm, and a
16 polydispersity index in the range of 1-1.2.

17 14. The amphipathic polymer particles of claim 13, further comprising a
18 polymerizable dye moiety, polymerized through the ATRP process.

19 15. The amphipathic polymer particles of claim 13, further comprising a cross linker
20 polymerized in the emulsion.

21 16. The amphipathic polymer particles of claim 13, wherein the content of the
22 hydrophobic moiety is in the range of 30% to 99% by weight, the content of the
23 hydrophilic moiety is in the range of 1% to 60% by weight,

24 17. A method of preparing amphipathic polymer particles comprising the steps of:
25 admixing an initiator having one or more radically transferable atoms or groups, a
26 hydrophilic monomer, a ligand and a catalyst to form an ATRP mix;
27 admixing one or more hydrophobic monomers, a surfactant, and water to form an
28 emulsion;
29 adding the emulsion to the ATRP mix to form the amphipathic polymer particles,
30 wherein the amphipathic polymer particles having sizes of about 50 to about 400
31 nm, and a polydispersity index of 1-1.2.

32 18. The method of claim 17, further comprising the step of filtering the reaction
33 mixture through a filter.

- 1 19. The method of claim 17, wherein the ATRP mix further comprises a
2 polymerizable dye monomer.
- 3 20. The method of claim 17, wherein the emulsion further comprises a cross linker.
- 4 21. The amphipathic polymer particles produced by the method of claim 17.
- 5 22. An ink composition comprising:
6 a vehicle,
7 a surfactant,
8 a pigment, and
9 amphipathic polymer particles prepared by the method of claim 17,
10 wherein said vehicle is water or a mixture of water and one or more humectants.
- 11 23. An ink composition comprising:
12 a vehicle,
13 a surfactant, and
14 amphipathic polymer particles prepared by the method of claim 19,
15 wherein said vehicle is water or a mixture of water and one or more humectants.